WHAT IS CLAIMED IS:

1. A multi-band transmission & reception-signal-generating apparatus for generating signals for transmission and reception of a multi-band used in a first communication system for handling transmission signals each modulated by using information on phases only, and a second communication system for handling transmission signals each modulated by using information also on amplitude components, said multi-band transmission & reception-signal-generating apparatus comprising:

constant-frequency-signal-generating means for generating a signal with a constant frequency;

transmission & reception-reference-oscillation-signal-generating means for generating a reception-reference-oscillation signal for generating a reception local oscillation signal for demodulation of a signal received by said first communication system in said first communication system and demodulation of a signal received by said second communication system in said second communication system, and a transmission-reference-oscillation signal for generating a transmission oscillation signal for transmission of a signal by said first communication system in said first

communication system and transmission of a signal by said second communication system in said second communication system; and

transmission-oscillation-signal-generating means for generating a transmission oscillation signal of said first communication system and a transmission oscillation signal of said second communication system by comparison of an input reference frequency with the frequency of a reference oscillation signal generated by said transmission & reception-reference-oscillation-signal-generating means, said input reference frequency being a properly set value of the frequency of a signal generated by said constant-frequency-signal-generating means,

wherein in the case of said second communication system, said transmission & reception-reference-oscillation-signal-generating means generates a reception local oscillation signal for demodulating a signal to be transmitted by said second communication system; and said transmission-oscillation-signal-generating means generates a transmission oscillation signal of said second communication system based on said reception reference oscillation signal generated by said transmission & reception-reference-oscillation-signal-generating means.

2. A multi-band transmission & reception-signal-generating apparatus according to claim 1, further comprising first modulation means for carrying out modulation based on said first communication system using said information on phases only on two mutually orthogonal base-band signals by utilizing said signal generated by said constant-frequency-signal-generating means at said constant frequency.

3. A multi-band transmission & reception-signal-generating apparatus according to claim 2 wherein, in the case of said first communication system, said transmission-oscillation-signal-generating means generates a transmission oscillation signal of said first communication system by oscillating a voltage-controlled oscillation means provided internally and dedicated to said first communication system with a modulation output of said first modulation means used as said reference frequency input so as to converge a frequency of said voltage-controlled oscillation means to said reference frequency input.

4. A multi-band transmission & reception-signal-generating apparatus according to claim 2 wherein said first modulation means has two equilibrium mixers constituting an orthogonal-modulation unit.

5. A multi-band transmission & reception-signal-generating apparatus according to claim 4 wherein, in the case of said second communication system, a power supply of one of said two equilibrium mixers is turned off and, if a DC voltage is applied to the other equilibrium mixer with a power supply thereof turned on, said signal generated by said constant-frequency-signal-generating means at said constant frequency set at a proper value is amplified.

6. A multi-band transmission & reception-signal-generating apparatus according to claim 1 wherein said first communication system is used in a TDMA system for generating signals for transmission and reception in a plurality of bands handled in said TDMA system.

7. A multi-band transmission & reception-signal-generating apparatus according to claim 1 wherein said second communication system is used in a CDMA system for generating signals for transmission and reception in a plurality of bands handled in said CDMA system.

8. A multi-band transmission & reception-signal-generating apparatus according to claim 1 wherein, when a received signal is received by direct conversion using said reception local oscillation signal generated by said transmission & reception-reference-oscillation-signal-

generating means in the case of said second communication system, an oscillation frequency generated by a voltage-controlled oscillation means provided internally in said transmission & reception-reference-oscillation-signal-generating means is made different from a reception frequency in order to remove a DC offset generated by coupling between said voltage-controlled oscillation means provided internally in said transmission & reception-reference-oscillation-signal-generating means and a circuit for carrying out reception by said direct conversion.

9. A multi-band transmission & reception-signal-generating apparatus according to claim 1, further comprising a frequency transformation means for fetching a signal with a frequency equal to a reception frequency generated by a voltage-controlled oscillation means provided internally in said transmission & reception-reference-oscillation-signal-generating means by mixing an oscillation-frequency signal having a frequency different from said reception frequency with a particular constant-frequency signal having a constant frequency thereof set at a proper value.

10. A multi-band transmission & reception-signal-generating apparatus according to claim 9 wherein said

particular constant-frequency signal having a constant frequency thereof set at a proper value is said constant-frequency signal generated by said constant-frequency-signal-generating means with a constant frequency thereof set at a proper value.

11. A multi-band transmission & reception-signal-generating apparatus according to claim 9 wherein, in the case of said second communication system, said transmission-oscillation-signal-generating means compares the phase of a signal having a reference frequency with the phase of a signal generated by at said transmission & reception-reference-oscillation-signal-generating means in order to make an oscillation frequency match a transmission frequency, said signal having said reference frequency being generated by said first modulation means by multiplication of said frequency of said constant-frequency signal generated by said constant-frequency-signal-generating means by a predetermined frequency-division ratio.

12. A multi-band transmission & reception-signal-generating method for generating signals for transmission and reception of a multi-band used in a first communication system for handling transmission signals each modulated by using information on phases only; and a

second communication system for handling transmission signals each modulated by using information also on amplitude components, said multi-band transmission & reception-signal-generating method comprising:

a transmission & reception-reference-oscillation-signal-generating step of generating a reception-reference-oscillation signal for generating a reception oscillation signal for demodulation of a signal received by said first communication system in said first communication system and demodulation of a signal received by said second communication system in said second communication system, and a transmission-reference-oscillation signal for generating a transmission oscillation signal for transmission of a signal by said first communication system in said first communication system and transmission of a signal by said second communication system in said second communication system; and

a transmission-oscillation-signal-generating step of generating a transmission oscillation signal of said first communication system and a transmission oscillation signal of said second communication system by comparison of an input reference frequency with the frequency of a reference oscillation signal generated by said

transmission & reception-reference-oscillation-signal-generating means, said input reference frequency being a properly set value of the frequency of a signal having a constant frequency.

13. A multi-band transmission & reception-signal-generating method according to claim 12 wherein, in the case of said second communication system, a reception local oscillation signal for demodulating a reception signal of said second communication system is generated in said transmission & reception-reference-oscillation-signal-generating step and, in said transmission-oscillation-signal-generating step, a transmission oscillation signal of said second communication system is generated on the basis of said reception local oscillation signal generated in said transmission & reception-reference-oscillation-signal-generating step.

14. A multi-band-radio-signal-transmitting & receiving apparatus for generating signals for transmission and reception of a multi-band used in a first communication system for handling transmission signals each modulated by using information on phases only, and a second communication system for handling transmission signals each modulated by using information on amplitude components, said multi-band transmission &

reception-signal-generating apparatus comprising:

constant-frequency-signal-generating means for generating a signal with a constant frequency;

transmission & reception-reference-oscillation-signal-generating means for generating a reception-reference-oscillation signal for generating a reception local oscillation signal for demodulation of a signal received by said first communication system in said first communication system and demodulation of a signal received by said second communication system in said second communication system, and a transmission-reference-oscillation signal for generating a transmission oscillation signal for transmission of a signal by said first communication system in said first communication system and transmission of a signal by said second communication system in said second communication system; and

transmission-oscillation-signal-generating means for generating a transmission oscillation signal of said first communication system and a transmission oscillation signal of said second communication system by comparison of an input reference frequency with the frequency of a reference oscillation signal generated by said transmission & reception-reference-oscillation-signal-

generating means, said input reference frequency being a properly set value of the frequency of a signal generated by said constant-frequency-signal-generating means,

wherein in the case of said second communication system, said transmission & reception-reference-oscillation-signal-generating means generates a reception local oscillation signal for demodulating a signal to be transmitted by said second communication system; and said transmission-oscillation-signal-generating means generates a transmission oscillation signal of said second communication system based on said reception reference oscillation signal generated by said transmission & reception-reference-oscillation-signal-generating means.